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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/679,343	10/07/2003	Masahiko Matsuo	001309.00049	2659

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EXAMINER	
FETZNER, TIFFANY A	
ART UNIT	**PAPER NUMBER**
2859	

DATE MAILED: 10/21/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/679,343	MATSUO ET AL.	
	Examiner	Art Unit	
	Tiffany A Fetzner	2859	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *07 October 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10/07/2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *10/07/2003*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

Information Disclosure Statement

2. The information disclosure statement filed 10/07/2003 has been placed in the application file, and initialed by the examiner but the information referred to therein has not been considered as to the merits, because applicant has not provided the examiner with an English Translation of the article that the applicant has submitted for consideration. The article dated May 2002, which may potentially qualify as prior art under 102 (a) or 103 (a) lists five authors three of which are listed as inventors of applicant's of the instant application. Because **the examiner does not have a certified English translation of the article** a proper determination as to the merits of the claims with respect to the article cannot be made. Additionally the fact that there is a different inventive entity on the application, than the authorship of the article raises the prior art issue of 102 (f), because the inventorship is an issue. If applicant desires the article to be considered, an official English translation of the article should be submitted in reply to this office action.

3. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(f) he did not himself invent the subject matter sought to be patented.

5. **Claims 1-8,** and **10-11** are rejected under **35 U.S.C. 102(b)** as being anticipated by **Reiderman et al.**, US patent 6,278,891 B1 issued August 21st 2001.

6. With respect to **Amended Claim 1**, **Reiderman et al.**, teaches "A method for processing magnetic resonance imaging image information wherein a magnetic resonance spectral intensity value" (i.e. a magnetic resonance signal amplitude components, for each of the millisecond relaxation times shown in figures 4, 5, 6, and 7 are graphically computer processed "magnetic resonance spectral intensity value(s)"). The examiner notes that figures 4, 5, 6, and 7 of **Reiderman et al.**, show that "a magnetic resonance spectral intensity value" is measured at each of a plurality of measuring points that are arranged at predetermined intervals along a lengthwise direction, a crosswise direction and a height direction on an object to be measured". Additionally, **Reiderman et al.**, teaches "several kinds of magnetic resonance imaging image information as a set of the magnetic resonance spectral intensity values measured at the measuring point are obtained by a plurality of different spectral intensity measuring methods with respect to the object to be measured" [See the different spectral intensity measuring methods of MRI (magnetic resonance imaging), NMR (nuclear magnetic resonance), MRS (magnetic resonance spectroscopy), QMR (Quantitative magnetic resonance) and NMR with CPMG (Carr-Purcell-Meiboom-Gill) which are taught in col. 4 line 38 through col. 8 line 20;].

7. **Reiderman et al.**, teaches and shows "a magnetic resonance spectral intensity value at the predetermined position" [See Figures 2,3 in combination with figures 4, 5, 6, and 7] "is obtained directly or indirectly from a measured results of the magnetic resonance spectral intensity values that is included in the magnetic resonance imaging image information and the predetermined position is set to be identical for all of the several varieties of magnetic resonance imaging

image information with respect to each of the magnetic resonance imaging image information", [See col. 10 line 44 through col. 15 line 31] "and new image information at the predetermined position is derived by linear calculation between the spectral intensity values" [See col. 12 line 20 through col. 15 line 31 where the ability to derive images that reflect bone mineral content from the amplitude (i.e. intensity measurements) of image magnitude, brightness, and density directly from the processed spectral values, satisfies the claim. The examiner notes that figures 8 and 9 show the use of "linear calculation between the spectral intensity values."

8. With respect to **Amended Claim 2**, **Reiderman et al.**, teaches "the new image information is information showing a bone structure." [See abstract, figures 8, 9; col. 7 lines 65-66; and col. 7 line 33 through col. 15 line 31 in general as forming an image of bone is a main point of the entire reference.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 2** and need not be reiterated.

9. With respect to **Amended Claim 3**, and **new claim 10**, which depend respectively from **claims 1** and **2**, **Reiderman et al.**, teaches obtaining "magnetic resonance imaging image information by a magnetic longitudinal relaxation measurement " (i.e. "t1") "and magnetic resonance imaging image information by a magnetic transverse relaxation measurement" (i.e. "t2"). [See col. 13 lines 26-32; where t1 and t2 relaxation measurements are taught; figures 4, 5, 6, and 7; which show relaxation time spectral measurement values, and the teachings of col. 7 line 33 through col. 15 line 31 concerning the fast and slow spectral relaxation times in general. The examiner notes that conventionally within the MRI / NMR art "t1" relaxation times are always longer (i.e. slower) than the "t2" relaxation times which are shorter (i.e. faster) in duration.] The same reasons for rejection, that apply to **claims 1, 2** also apply to **claims 3, 10** and need not be reiterated.

10. With respect to **Amended Claim 4**, and **new claim 11**, which depend respectively from **claims 3** and **10**, **Reiderman et al.**, teaches obtaining

"magnetic resonance imaging image information by a nuclear density measurement". [See figures 8, 9; col. 14 line 6 through col. 15 line 18, and especially **col. 7 lines 33-38**; where the nuclear magnetic resonance measurements are used to determine a density of the bone mineral content by measuring the "amount of hydrogen nuclei from within a selected portion of the bone, where the selected portion has a known volume."] The same reasons for rejection, that apply to **claims 1, 2, 3, 10** also apply to **claims 4, 11** and need not be reiterated.

11. With respect to **Amended Claim 5, Reiderman et al.**, teaches "that with respect to at least one kind of the magnetic resonance imaging image information, a magnetic resonance spectral intensity value at the predetermined position" [See figures 2, 3] "is obtained by interpolation of the measured results of the magnetic resonance spectral intensity value that is included in the magnetic resonance imaging image information." [See col. 7 line 33 through col. 15 line 31; and figures 2 through 9.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 5** and need not be reiterated.

12. With respect to **Amended Claim 6, Reiderman et al.**, teaches "that the magnetic resonance spectral intensity value" (i.e. the amount of NMR signal at each spectrally measured location) "is a hydrogen nucleus magnetic resonance spectral intensity value." [See col. 7 lines 33-42; figures 4 through 9; col. 4 line 38 through col. 15 line 31.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 6** and need not be reiterated.

13. With respect to **Amended Claim 7, Reiderman et al.**, teaches and shows via figures 8 and 9 that "a comparison is further made between new image information obtained by a linear calculation of the spectral intensity values at the predetermined position and image information obtained by an X-ray computed tomography." [See figures 8, 9; col. 13 line 66 through col. 15 line 18] The same reasons for rejection, that apply to **claim 1** also apply to **claim 7** and need not be reiterated.

14. With respect to **Amended Claim 8, Reiderman et al.**, teaches and shows "A magnetic resonance imaging system that is used in the method for processing magnetic resonance imaging image information described in **claim 1**, comprising" a system "functioning at least as an information obtaining portion that obtains magnetic resonance imaging image information" [See figures 1, 2, and 3], "a first obtained image information storing portion that stores magnetic resonance imaging image information obtained by a predetermined method" [See the computer of col. 5 lines 55-61, and control unit 22 of figure 1, which carry out a first imaging method of col. 9 line 62 through col. 13 line 65], "a second obtained image information storing portion that stores magnetic resonance imaging image information obtained by a method different from the predetermined method" [See the computer of col. 5 lines 55-61, and control unit 22 of figure 1, which carry out a first imaging method of col. 13 line 64 through col. 15 line 31], "a linear calculation portion" (i.e. the computer processing) "that conducts a linear calculation" (See figures 8, 9) "based on the magnetic resonance imaging image information stored in the first obtained image information storing portion and the magnetic resonance imaging image information stored in the second obtained image information storing portion" [See figures 8, 9, col. 15 lines 6-31], "a calculated result image information storing portion that stores new image information as a calculated result of the linear calculation portion and an image output portion that outputs an image based on the image information stored in the calculated result image information storing portion'. [See the computer of col. 5 lines 55-61, and control unit 22 of figure 1, figures 1, 3, 8, 9, col. 4 line 38 through col. 15 line 31] The same reasons for rejection, that apply to **claim 1** also apply to **claim 8** and need not be reiterated.

15. **Claims 1, 2, 5, 6,** and **7,** are rejected under **35 U.S.C. 102(b)** as being anticipated by **Taicher et al.**, US patent 6,285,901 B1 issued September 4th 2001.

16. With respect to **Amended Claim 1, Taicher et al.**, teaches "A method for processing" / analyzing "magnetic resonance imaging image information wherein

a magnetic resonance spectral intensity value" (i.e. a magnetic resonance signal amplitude components, for each of the relaxation times shown in figures 5, and 6 are graphically computer processed "magnetic resonance spectral intensity value(s)"). The examiner notes that figures, 3, 4, 5, 6 and 9 of **Taicher et al.**, show that "a magnetic resonance spectral intensity value" is measured at each of a plurality of measuring points that are arranged at predetermined intervals along a lengthwise direction, a crosswise direction and a height direction on an object to be measured". [See figures 9, 3 for lengthwise, crosswise, and height directions.] Additionally, **Taicher et al.**, teaches "several kinds of magnetic resonance imaging image information as a set of the magnetic resonance spectral intensity values measured at the measuring point are obtained by a plurality of different spectral intensity measuring methods with respect to the object to be measured" [See the different spectral intensity measuring methods of MRI (magnetic resonance imaging), NMR (nuclear magnetic resonance), MRS (magnetic resonance spectroscopy), QMR (Quantitative magnetic resonance) and NMR with CPMG (Carr-Purcell-Meiboom-Gill) which are taught in col. 4 line 32 through col. 6 line 56;].

17. **Taicher et al.**, teaches and shows "a magnetic resonance spectral intensity value at the predetermined position" [See Figures 2,3, 9 in combination with figures 4, 5, 6, 7, and 8] "is obtained directly or indirectly from a measured results of the magnetic resonance spectral intensity values that is included in the magnetic resonance imaging image information and the predetermined position is set to be identical for all of the several varieties of magnetic resonance imaging image information with respect to each of the magnetic resonance imaging image information", [See col. 6 line 65 through col. 16 line 12] "and new image information at the predetermined position is derived by linear calculation between the spectral intensity values" [See col. 12 line 38 through col. 14 line 35 where the ability to derive images that reflect bone mineral content from the amplitude (i.e. intensity measurements) of image magnitude, brightness, and density directly from the processed spectral values, satisfies the claim. The examiner

notes that figures 8 shows the use of "linear calculation between the spectral intensity values."

18. With respect to **Amended Claim 2**, **Taicher et al.**, shows "the new image information is information showing a bone structure." [See figures 4, 7 ,8, 9, col. 8 lines 15-32; col. 16 lines 4-11The same reasons for rejection, that apply to **claim 1** also apply to **claim 2** and need not be reiterated.

19. With respect to **Amended Claim 5**, **Taicher et al.**, teaches "that with respect to at least one kind of the magnetic resonance imaging image information, a magnetic resonance spectral intensity value at the predetermined position" [See figures 2, 3] "is obtained by interpolation of the measured results of the magnetic resonance spectral intensity value that is included in the magnetic resonance imaging image information." [See col. 6 line 65 through col. 16 line 12; and figures 2 through 9.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 5** and need not be reiterated.

20. With respect to **Amended Claim 6**, **Taicher et al.**, teaches "that the magnetic resonance spectral intensity value" (i.e. the amount of NMR signal at each spectrally measured location) "is a hydrogen nucleus magnetic resonance spectral intensity value." [See col. 6 line 65 through col. 7 line 21; col. 13 lines 25-33 figures 4 through 9; col. 4 line 32 through col. 16 line 12.] The same reasons for rejection, that apply to **claim 1** also apply to **claim 6** and need not be reiterated.

21. With respect to **Amended Claim 7**, **Taicher et al.**, teaches and shows via figures 8 and 9 that "a comparison is further made between new image information obtained by a linear calculation of the spectral intensity values at the predetermined position and image information obtained by an X-ray computed tomography." [See figures 8, 9; col. 12 line 38 through col. 14 line 35] The same reasons for rejection, that apply to **claim 1** also apply to **claim 7** and need not be reiterated.

22. **Claims 1-11** are rejected under **35 U.S.C. 102(f)** because the applicant did not invent the claimed subject matter. The Japanese article "Research of

Structural Image Process for Optical Brain Function Measurement" (May 2002) page 55 is relevant to all the claims in the instant application as MRI and X-ray CT are taught together and compared, as best as the examiner can determine, from what can be understood in the English language without a translation. Due to the different authorship/inventive entity the question of inventorship is raised. In order to overcome this rejection an English translation of the article should be provided to the examiner, so that a full evaluation on the merits of this article and applicant's claims can be determined. The issue of inventive entity must be resolved in order to determine if the article provided is applicable prior art against the claims of the instant application.

Claim Rejections - 35 USC § 103

23. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

24. The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

25. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of

35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

26. **Claim 9** is rejected under **35 U.S.C. 103(a)** as being unpatentable over by **Reiderman et al.**, US patent 6,278,891 B1 issued August 21st 2001; as applied to **claims 1-8, 10, 11** above in further view of **Giger et al.**, US patent 5,974,165 issued October 26th 1999.

27. With respect to **Amended Claim 9**, **Reiderman et al.**, lacks directly teaching that the system components function "as an interpolating calculation portion that three-dimensionally aligns the magnetic resonance imaging image information stored in the first obtained image information storing portion with the magnetic resonance imaging image information stored in the second obtained image information storing portion and a spectral intensity value at the predetermined position set identical to other measuring point is obtained by interpolation of the magnetic resonance imaging image information stored in either one of the first and the second obtained image information storing portions." However **Giger et al.**, teaches this limitation because in **Giger et al.**, radionuclide (i.e. NMR / MRI) images are combined with radiographic (i.e. x-ray CT) images to form both two and three dimensional images that are superimposed on one another with automatic registration by computer processing of the two different types of images onto an overall radiographic chest image. [See **Giger et al.**, abstract, figures 1 through 19D ; col. 1 line 52 through col. 9 line 14]

28. It would have been obvious to one of ordinary skill in the art at the time that the invention was made to modify the teaching of **Reiderman et al.**, with the teaching of **Giger et al.**, in order to expand the teachings of **Reiderman et al.**, into the formation of a three-dimensional superimposed image, because **Reiderman et al.**, already shows the combining of NMR / MRI measurements with x-ray measurements in figures 8 and 9 and teaches that a image of the actual human bone is producible with the combined technique using "any suitable image developing technique known in the art" [See **Reiderman et al.**, col. 15

lines 7-8], and the **Giger et al.**, reference is a "suitable image developing technique" that was already known in the art, at the time of the **Reiderman et al.**, inventive method. Therefore It would have been obvious to one of ordinary skill in the art at the time that the invention was made that the super positioning of NMR / MRI images and x-ray CT images is neither novel nor nonobvious over the existing prior art techniques available to an individual of ordinary skill. The same reasons for rejection, that apply to **claims 1, 8** also apply to **claim 9** and need not be reiterated.

Prior Art of Record

29. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

A) Steines et al., US patent 6,,799,066 B2 issued September 28th 2004, filed September 14th 2001, which teaches a technique for manipulating medical images including MRI and x-ray images.

B) Matsuo et al., US patent application publication 2004/0150399 A1 published August 5th 2004, filed October 7th 2003. This reference is applicant's originally filed instant application. It is noted for the purposes of a complete record but is not prior art against the applicant's claims.

Conclusion

30. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tiffany Fetzner whose telephone number is: (571) 272-2241. The examiner can normally be reached on Monday-Thursday from 7:00am to 4:30pm., and on alternate Friday's from 7:00am to 3:30pm.

31. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Diego Gutierrez, can be reached at (571) 272-2245. The **only official fax phone number** for the organization where this application or proceeding is assigned is **(703) 872-9306**.

TAF
October 15, 2004

Diego Gutierrez
Supervisory Patent Examiner
Technology Center 2800

CHRISTOPHER W. FULTON
PRIMARY EXAMINER